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ABSTRACT

A study was conducted to examine the relationship of perceptual motor skills as measured by the Bender Visual Motor Gestalt Test to word recognition, oral reading, and silent reading. In addition, perceptual motor skill and auditory comprehension were compared as correlates of the three reading variables. Subjects were 60 primary grade students in a clinical setting. Although the sample had been referred to the clinic for suspected reading problems, two-thirds of them were not in need of remedial assistance, and many were reading significantly above their grade placement. All were high within the average range for the WISC Full Scale IQ Test. The subjects were administered the Bender test--scored according to the Koppitz system--the results of which were compared to the word recognition level, instructional level, and independent level achieved on Spache's Diagnostic Reading Scales (SDRS). Auditory comprehension scores were obtained from the potential level of the SDRS. Results showed that perceptual motor skill, as measured by the Bender, was not sufficiently independent of IQ to be useful as a potential predictor of reading skill. Also, auditory comprehension was consistently higher in correlation with word recognition, oral reading, and silent reading than the Bender test. The findings suggest that although the Bender might be a useful tool for many clinicians in helping to recognize other problems, it is not a valid predictor of reading ability. (FL)

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A COMPARISON OF PERCEPTUAL MOTOR SKILL WITH AUDITORY COMPREHENSION AS CORRELATES OF WORD RECOGNITION, ORAL READING, AND SILENT READING

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The relationship of perceptual motor skills to reading achievement continues to receive emphasis in the public press and in professional journals. Assumptions based upon perceptual motor deficits as a cause of reading and learning problems have become the basis of a number of extensive diagnostic and remedial systems. Tests and remedial approaches based upon such assumptions have been criticized in excellent reviews by Balow (1971), Hammill, Goodman, and Wiederholt (1974), and Harris (1969). All emphasize the lack of supportive research for programs such as those offered by Delacato (1959), Frostig (1964), and Kephart (1960). Perhaps, as was expressed by Harris, "Publicity has far outstripped proof," since research of perceptual motor skills has established little or no specificity for reading skills. Such is not to say that perceptual motor programs have no value elsewhere in the curriculum, but there is presently little or no empirical basis for promoting them as diagnostic procedures or cures for reading problems.

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Despite the expanding body of nonsupportive research, perceptual motor tests and programs continue to be promoted almost as necessities in the reading program. In a recent article, Saphier (1973), even though admitting the problems involved in relating perceptual motor skills to reading ability, encouraged the use of the Bender Visual Motor Gestalt Test (Bender, 1938) as a useful tool in identifying children with reading problems. It is true that the Bender has been involved in a relatively large number of studies which have examined the relationship between perceptual motor skills and reading.

According to Koppitz (1964), it is the visual motor function of the Bender which relates it to reading. Chang and Chang (1967), Hammer (1967), Henderson, Butler, and Gaffeney (1969), Keogh (1963, 1965), Koppitz (1964, 1970), Parrish (1962), and Thweatt (1963) have concluded that the Bender has some utility as a predictor of reading ability. However, caution is suggested by Schellenberg (1963) who found that the Bender tended not to be functional at third grade level because the variations in the scoring system he used were too gross for older children. Further concern is raised by the work of Henderson, Butler, and Gaffeney (1969) and Keogh (1963, 1965) whose findings indicated that the correlations between the Bender and reading ability became much less significant when IQ was controlled. Some researchers including Lachman (1960) have not been able to distinguish between good and poor readers on the basis of Bender performance.

None of the research suggests that the relationship between the Bender and reading ability is strong enough to have value in individual prediction.

On the other hand, some of the more academically oriented variables have shown promise as possible predictors of reading ability. In particular, auditory comprehension as measured by Spache's Diagnostic Reading Scales (Spache, 1963) was found by Moe (1958) to be a better predictor of reading achievement than several standarized reading readiness tests. Tillman (1970) showed that listening comprehension, as measured by the Spache test, was significantly correlated with "true gain" in reading after remedial tutoring. Spache and Spache (1973) suggest that auditory comprehension reflects the degree to which a child has been challenged and stimulated to use his reasoning abilities in the home. Thus, auditory comprehension is felt to be an important factor in reading comprehension.

The present study examined the relationship of perceptual motor skill, as measured by the Bender, with word recognition, with oral reading, and with silent reading. Also perceptual motor skill and auditory comprehension were compared as correlates of the three reading variables. It was considered crucial to the purposes of the study that age and IQ be controlled and that the reading variables be measured by individual testing.

Method

Materials

As indicated above, the Bender Visual Motor Gestalt Test (Bender, 1938) was used as a measure of perceptual motor skill. Bender materials were scored according to the Koppitz System (1964) by a skilled examiner. Instead of using one general group measure of reading ability, as had been done in many previous studies, the Word Recognition Level, the Instructional Level, and the Independent Level scores of the individually administered Diagnostic Reading Scales (Spache, 1963) were used as criterion variables. Thus, a measure of recognition of words in isolation, a measure of oral reading fluency and comprehension, and a measure of silent reading comprehension respectively, were obtained for each child. The intelligence measure used was the Full Scale IQ of the Wechsler Intelligence Scale for Children (WISC). Auditory or listening comprehension was measured by the Potential Level Score of the Diagnostic Reading Scales (DRS). The Bender, the DRS, and WISC were administered by skilled clinicians as part of the diagnostic reading process for children at the University of Florida Reading and Study Skills Center.

Subjects

Data was collected from pupils in the first 3 school grades. Of 67 who had been given the WISC, the Bender, and the DRS, 7 were eliminated because of below normal IQ. The 60 children remaining averaged mid-second grade in school placement. In regard to reading ability 20, or one-third of

the sample, were 1 or more years below grade placement on 2 or more of the reading scales and were considered to be in need of remedial help. Although the sample had been referred for suspected reading problems, two-thirds of the group were not in need of remedial assistance. Many were reading significantly above their grade placement. Table 1 summarizes additional descriptive data for the sample.

TABLE 1

Sample Descriptive Data
(N=60)

	Mean	Range	Standard Deviation
Age in months	94.7	75-107	8.4
WISC Full Scale IQ	107	88-134	11
Potential Level[a]	4.7	2.8-7.5	1.0
Bender Developmental Score[b]	5.2	0-12	2.9
Word Recognition[a]	2.4	1.0-5.5	1.0
Oral Reading[a]	2.4	1.0-4.5	1.1
Silent Reading[a]	2.7	1.0-5.5	1.3

Note.--[a]Grade level scores.
[b]Koppitz, 1964.

As a group the children were just under eight years in age and were high within the Average range for WISC Full Scale IQ. It can be seen that average reading levels, except for Potential Level, were consistent with the average age and grade placement of the sample. Data published in the Diagnostic Reading Scales Manual by Spache (1963) suggest that an

elevated Potential Level is a normal expectation and that the relatively high Potential Level of the present sample is normal. The average Developmental Bender Score is one score point higher than would be expected from norms established by Koppitz (1964) which might be a normal variation for a clinic population.

Analyses

Data on the seven variables of Table 1 were subjected to a multiple correlation analysis. Intercorrelations among the variables were examined for significance.

Multiple correlations involving Potential Level, age, and IQ with each reading scale were compared with multiple correlations involving the Bender, age, and IQ with each of the three reading criteria. Comparisons were also made between partial correlations involving Potential Level with each of the three reading criteria and partial correlations involving the Bender with each reading scale when age and IQ were held constant. Results of the different correlation anslyses are given below in Tables 2, 3, and 4.

Results and Discussion

In Table 2 simple correlations among the seven variables of the study can be examined. As could be expected the reading scales were highly intercorrelated. Potential Level was significantly ($p < .01$) related to Word Recognition, Oral Reading, and Silent Reading. Bender correlations with the reading scales were uniformly lower in magnitude but were

TABLE 2

Simple Correlation Matrix for the Seven Variables of the Study

	Age	WISC IQ	Potential Level	Bender	Word Recognition	Oral Reading	Silent Reading
Age	1.00	-0.21	0.52**	-0.38**	0.41**	0.49**	0.56**
WISC IQ		1.00	0.07	-0.16	0.32**	0.30*	0.25*
Potential Level			1.00	-0.14	0.42**	0.44**	0.62**
Bender[a]				1.00	-0.26*	-0.32**	-0.26*
Word Recognition					1.00	0.89**	0.86**
Oral Reading						1.00	0.90**
Silent Reading							1.00

Note.--[a]Negative Bender correlations are expected since scoring is based on errors.
*Significant at .05 level.
**Significant at .01 level.

also consistently significant. Interestingly, correlations in this sample involving age and especially IQ with reading were somewhat lower than reported by Spache (1963) and Koppitz (1964). Age and IQ tended to be negatively related, but the correlation was below the level required for statistical

significance. Probably the negative direction of the correlation between age and IQ and the comparatively lower correlation between IQ, Bender, and Potential Level can be accounted for by the nature of clinic children. Most of the children seen at the clinic are referred because they are doing poorly in school. Over time, these children might fall further behind scholastically, and their lag is reflected in their IQ scores.

In Table 3 it can be seen that all multiple correlation coefficients were statistically significant. However, R was slightly but consistently higher when Potential Level, rather than the Bender, was added as an independent variable. Amount of increase in R^2 was also consistently in favor of the Potential Level score.

TABLE 3

The Bender and Potential Level in Multiple Correlation Analyses of Reading Scores

Dependent Variable	Multiple Independent Variables: Bender, Age, WISC	Multiple Independent Variables: Potential Level, Age, WISC	Increase in R^2 when Bender was added	Increase in R^2 when Potential Level was added
Word Recognition	.58**	.60**	.000	.025
Oral Reading	.63**	.65**	.002	.015
Silent Reading	.68**	.75**	.003	.096

**Significant at .01 level.

Results of the partial correlation analyses can be seen in Table 4. Only the partial correlation between Silent Reading and Potential Level was statistically significant when age and intelligence were held constant. However, the other two partial correlations involving Potential Level and Oral and Silent Reading, though small, were substantial compared to those involving the Bender. Partial correlations involving the Bender were .00 with Word Recognition and very low with Oral and with Silent Reading.

TABLE 4

The Bender and Potential Level in Partial Correlation Analyses with Word Recognition, with Oral Reading, and with Silent Reading

Reading Scale	Bender	Potential Level	Factors Held Constant
Word Recognition	0.00	0.19	Age and IQ
Oral Reading	-0.06	0.17	Age and IQ
Silent Reading	0.08	0.42*	Age and IQ

*p .05

Conclusions

In a reading clinic population of sixty primary-aged children, auditory comprehension was consistently higher in correlation with word recognition, oral reading, and silent reading than the Bender test. Correlations favored auditory comprehension over the Bender in simple correlation analyses,

multiple correlation analyses, and partial correlation analyses with age and IQ held constant. When age and IQ were partialled out, correlations between the Bender and the reading variables were nearly nonexistent. However, a substantial relationship between auditory comprehension and especially silent reading remained when IQ and age were controlled. Thus, the possible utility of auditory comprehension in predicting silent reading ability was supported. Perceptual motor skill, as measured by the Bender, was found not to be sufficiently independent of IQ to be useful as a potential predictor of reading skill. Although the Bender might be a useful tool for many clinicians in helping to recognize other problems, results of this study did not support its potential use as a predictor of reading ability.

While it is recognized that statistical procedures such as partial correlation might not be as conclusive as more refined experimental control, the consistency of the results of the present analyses is compelling. However, there is an obvious need for additional research in which IQ and age can be carefully controlled and perceptual motor skill can be more extensively measured. Also other types of well-defined groups should be studied.

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